

MANUAL FOR
CorroZOA

Precautionary notes



ATTENTION



Read this before use!

Do not connect input terminals of this equipment to AC main power source.

Do not submerge any part of this system in water or other types of liquid.

Do not clean any part of the system with high pressure.

To avoid damaging the high impedance input, follow the procedure for connecting and disconnecting equipment.

When equipment is shut off remove it from reference electrode.

Service on this equipment must be performed by qualified personnel only. FORCE Technology is not responsible for any problems occurred due to unauthorized repair.



This symbol on the product or on its packaging indicates that this product must not be disposed of with household waste according to the directive of Waste Electrical and Electronic Equipment (WEEE) (2202/96/EC). Therefore, FORCE Technology offers to dispose of any equipment bought from FORCE Technology, a subsidiary company or an agent provided that the equipment is returned to FORCE Technology's address at sender's expense.

Manual version 1.0 Issue date: 17/12-2010

This manual covers:

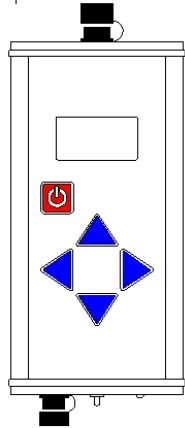
CorroZOA firmware version 1.02, FORCE Technology Corrosion meter

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System parts

Input terminals



Charging LED,
Dataconnector
and eyebolt



Wall adapter for charging



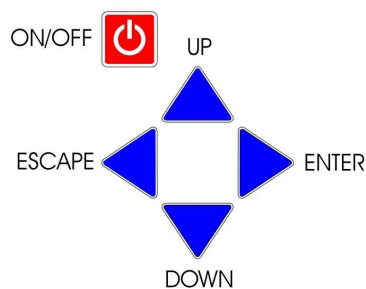
USB data cable



Standard breakout
cable

Keypad

The keypad consists of five keys - a red on/off key and four arrow keys.



The Enter arrow key selects a submenu or accepts a choice.

The Escape arrow key exits from a sub menu or declines.

The Up and Down keys may be used for stepping through the menus or to change a parameter.

Connecting and disconnecting

To avoid damaging the input amplifier inside the CorroZOA due to static discharge, follow the procedure below when connecting and disconnecting the equipment.



Electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit.

Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

Large electro motors and frequency converters are know to be noise sources.

Connecting:

Keep the meter in one hand while touching the steel reinforcement lead with the other. The electrostatic potential between the operator and the steel reinforcement are hereby reduced to a safe level.

Connect the electrode leads to the input terminals.

Disconnecting:

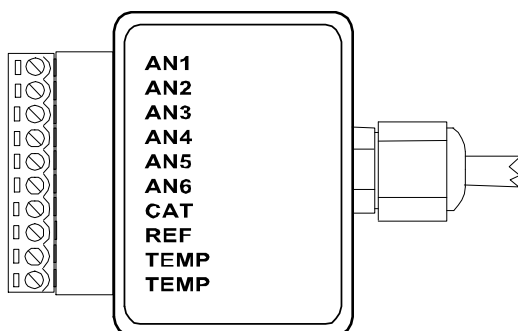
Before touching the equipment it is important that the electrostatic potential is reduced to a safe level by touching some kind of earth connection with a finger.

(An earth connection may be the steel reinforcement, a radiator or water pipe close to the reference electrode)

Note:

If the operator keeps the meter in hand all time during the measurement it is not necessary to make a discharge before disconnecting

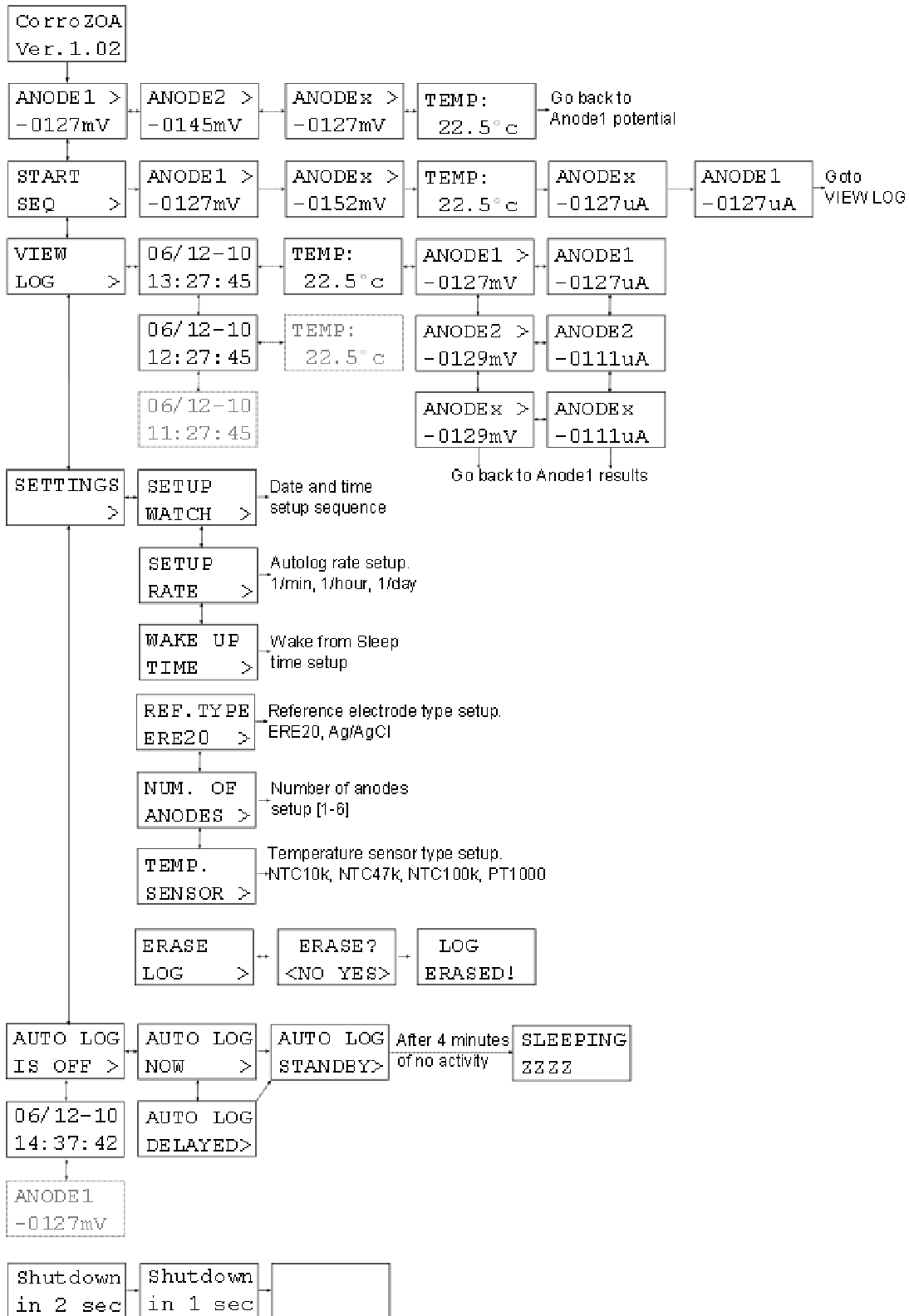
Standard breakout cable



The breakout cable consists of a ten screw terminals starting from the top with Anode1 to 6, followed by cathode, reference electrode and two temperature sensor terminals.

Menu overview

Attention: All values are examples



Functions

Start up and shut down

To switch on the equipment keep pressing the red on/off button until the device starts.

To switch off the equipment press the on/off key for approx. 4 sec.

The equipment will auto shutdown after 4 minutes of no action unless it is in autolog mode or connected to a PC.

Measure

After startup CorroZOA will show the measure screen for ANODE1 potential.


ANODE1 > -0127mV

To view potentials for the other anodes press Enter key.

To view the temperature at the temperature sensor keep pressing the Enter key.

 **Remember to select the right temperature sensor and reference electrode in the settings menu.**

Low battery status is indicated by a short “LOW BATTERY” message.

 **The equipment will be able to continue measuring when battery indicator shows “low battery”. However no further warnings will appear before the battery level reach a critical level and the system shuts down. No data will be lost as they a stored in a flash memory.**

Start a measure sequence

A measure sequence consists of a set of potential measurement (1-6) referring to the reference electrode, a temperature and a set of corrosion currents (1-6).

The measurement is automatically stored in the FLASH-memory. The memory may store 999 measurement.

To set the number of anodes, reference electrode and temperature sensor type enter the settings menu.

Following settings are possible:

The numbers of anodes	1 to 6
Reference electrode	ERE20 or Ag/AgCl
Temperature sensors	NTC10k, NTC47k, NTC100k and PT1000

Different β -values for the NTCs may be entered after selection of NTC

To start the sequence - press the Enter key.

START SEQ >

Each sequence is stored with date and time including information about reference electrode type and temperature sensor type.

Reference and temperature sensor type are not display in the View log menu but will be present in the CSV-file at the PC.

Maximum number of measurements in the log is 999.

If the operator tries to store a measurement when the log is full the display will show "NO MORE MEMORY" for 1 sec.

Erasing the log

To erase the log - press the up or down key until the settings screen appears.

SETTINGS >

Press the enter key once to enter the settings menu

Press the up or down key until the "Erase log" screen appears.

ERASE LOG >

Press enter key once. A YES/NO prompt will appear.

```
ERASE?  
<NO YES>
```

Press enter key to erase log or press escape key to cancel the erase procedure.

 **By erasing the log ALL stored measurements are erased permanently.**

Date and Time

To view system watch press the up or down key until the date and time screen appears.

```
20/07-05  
21:26:22
```

Date format is:

DAY / MONTH – YEAR

Time format is 24-hours.

To change time and date – press the up or down key until the settings screen appears.

```
SETTINGS  
>
```

Press the enter key once to enter the settings menu

```
SETUP  
WATCH >
```

Press the enter key once to start changing time and date.

Use the up and down key to make the changes.

Accept the changes by pressing the enter key.

The seconds are set to 00 at the last step.

Auto log

The auto log function lets the CorroZOA work as multi channel datalogger.

Each measurement is stored with date and time.

Log start time and logging rate may be set in the settings menu.

By default the log start time is the moment when the auto log is activated.

To prepare the auto log press the up or down key until the settings screen appears.

```
SETTINGS
  >
```

Press the enter key once to enter the settings menu.

Press the up or down key until the setup rate screen appears.

```
SETUP
RATE  >
```

Press the enter key to view or change the rate setting. Use up and down key to make changes.

The rate may be set to:	The log may hold up to:
1 measurement / minute	Approx 16 hours of measurements
1 measurement / hour	Approx 41 days of measurements (external powersupply is required)
1 measurement / day	999 days of measurements (external powersupply is required)

Press enter key to accept the rate setting. This setting is stored in internal flash memory and will here after be the default setting at power up.

To delay the auto log start to a time within the next 24 hours press the down key until the wake up time screen appears.

```
WAKE UP
TIME  >
```

The delay function is by default disabled (log start time is set to 24:00).

To change the log start time press enter key. Use the up and down key to make the changes. By pressing the enter key the current hour/min setting is accepted. This setting is stored in flash memory and will the default setting.

Press the escape key once to return to main menu.
Press the up or down key until the auto log control screen appears.

```
AUTO LOG  
IS OFF >
```

Press the enter key to activate the auto log function.

```
AUTO LOG  
NOW >
```

To activate the auto log function immediately press the enter key.
Or to postpone the auto log start to the wake up time press the up or down key until Auto log delayed screen appears.

```
AUTO LOG  
DELAYED >
```

Press the enter key to accept. The standby screen appears.

```
AUTO LOG  
STANDBY>
```

If no key have been hit for more the 4 minutes the system will enter sleep mode to save power. This is indicated with the sleeping screen.

```
SLEEPING  
ZZZZ
```

The system will automatically leave sleep mode when it is time to start a new measuring sequence.

The user may force the system to leave sleep mode by pressing the up or down key once. After 4 minutes of no activity the system will again enter sleep mode again.



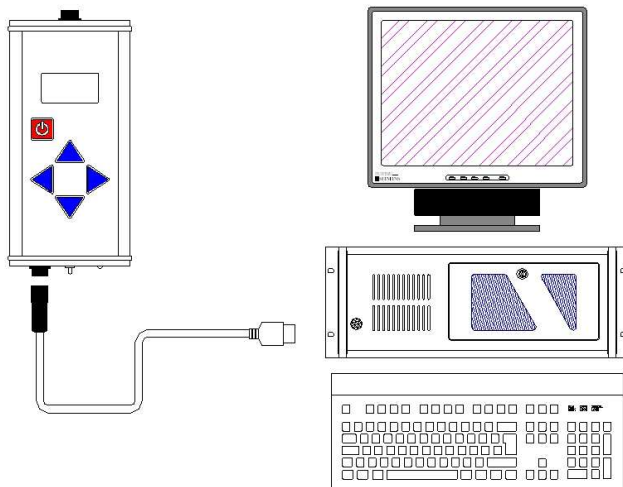
The CorroZOA must be awake (not in sleep mode) to be able to communicate with a PC.

Connect to PC

Get log from device

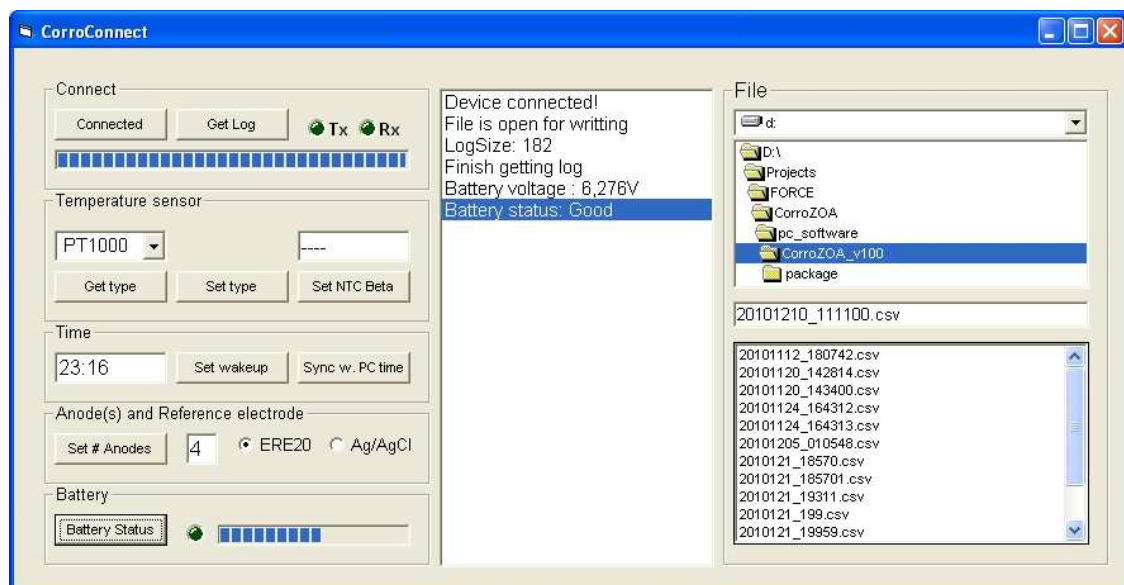
To transmit the log to a PC, follow the procedure below:

1. Connect the CorroZOA to the PC with the USB cable.



2. Start the PC program CorroConnect (see installation at page 14).

By default the program will auto generate a filename for the log file based on date and time. The operator may change this filename and the store location before the log is received.



3. Press “Connect” – the system will now search for the device.
If the device is in sleep mode it will not be able to communicate with the PC. Press a button on the once – the CorroZOA will wakeup within 2 seconds.

4. Press the “Get Log”.
When the gauge reach maximum the log is transmitted.
The log data may now be inspected with Excel or a normal text editor like Notepad.
Double-click at a filename (*.csv) in the file overview window to launch and load Excel.

Setup device with CorroConnect

All settings may be set with the PC program CorroConnect.

Temperature sensor

To set the temperature sensor type select a type in the dropdown menu and pres the Set type button.

To verify the setting press the Get type button.

Time

To setup the internal watch in the CorroZOA press the Sync. w. PC time button. The current PC time will now be transmitted to the device.

Wake up time

Enter a time in the wakeup time input field and press the Set wakeup time button.

Valid time format is HH:MM (24-hour).

To verify the setting, click once with the mouse in the input field.

Number of anodes

The number of anodes may be changed anode number field. A valid number is between 1 and 6. Press Set # anodes button to transmit the setting.

To verify the setting, click once with the mouse in the input field. This will also refresh the actual setting of reference electrode type.

Reference electrode type

To change the reference electrode type click the type selector button.

To verify the setting, click once with the mouse in the anode number input field.

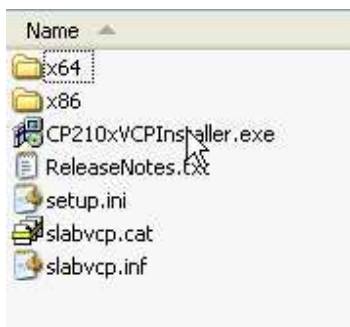
Battery status

To get a hint of the battery charge state, press the Battery status button. The LED (next to the battery status button) will be green when battery is ok. Yellow when battery level is lower but still ok to make some measurement and red when battery level is critical and must be charged before use.

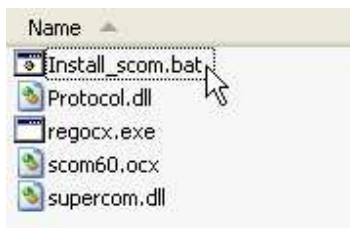
PC software Installation

To install the PC-software follow the procedure below:

1. Insert the CD-ROM in the CD-ROM drive.
2. From the windows “Start menu” select “Run...”
3. Press the Browse button and enter CD-ROM drive
4. Enter subfolder Windows_XP_S2K3_Vista_7



5. Run CP210xVCPInstaller.exe and follow instructions.
6. Exit subfolder and enter subfolder Scom.



7. Run Install_scom.bat
8. Exit subfolder
9. Run setup.exe and follow instructions.

If windows indicates that a file is in use – choose “Ignore”.

If windows indicates that a file to be installed is older then the one already installed – choose “keep the newest”

Battery and Charging

The CorroZOA will run for approx. 200 hours on a fully charged battery at 20°C.
Charge time for a full charge is approx. 2 hours.

The CorroZOA will auto shut down if no key has been pressed for more then 4 minutes.
The auto shut down function is switched off during auto logging and during data transmission.

Low battery status is indicated by a short message every 10 sec.


Note: No data will be lost if the battery runs low. All data and settings are stored in FLASH-memory.


To charge the battery:

Connect the wall adaptor to the data connector.

Connect wall adaptor to main power outlet.

The red LED will turn on while charging.

-  Internal mechanism will prevent the battery from charging if the battery temperature is below 5°C or above 40°C.

-  Do not use the wall adaptor as an external power supply during long time logging.
Please consult FORCE Technology for an external power source solution.

System specifications

Voltage input range	± 2000 mV
Current input range	± 2 mA
Reference electrode types	All types
Input impedance	
- on state	> 20 Mohm
- shut down state	< 100 kohm
Resolution	1 mV / 1uA
Temperature coefficient	< 20 ppm/ $^{\circ}$ C
Power source	Internal NiMH AAA
Battery lifetime	Approx 200 hours
Auto power down	4 minutes
Start up time	4 sec.
Display refresh rate	1 / sec.
Sealed	IP58
Ambient temperature range when	
- Measuring	- 10 $^{\circ}$ C to 40 $^{\circ}$ C
- Charging	5 $^{\circ}$ C to 40 $^{\circ}$ C
Size including terminals	H: 40mm W: 85mm L:185mm
Weight	375 g
Log size	999 measurements

EMC:

This product complies with requirements of the following European Community Directives: 89/ 336/ EEC (Electromagnetic Compatibility) and 73/ 23/ EEC (Low Voltage) as amended by 93/ 68/ EEC (CE Marking).

However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.